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CONTENTS

The Simple Dressing after Cataract Extraction, by T. E. Murrell, M.D.	121
Scientific Proceedings of Section of Ophthalmology, A. M. A., at the Milwaukee Meeting.	
ABSTRACTS OF PAPERS, DISCUSSIONS IN FULL.	
Brain Tumors with Optic Neuritis as the only positive sign.—Autopsy, by E. P. Morrow, M.D.	131
Discussed by:—Dr. de Schweinitz.	133
Dr. Morrow.	135
Optic Nerve Troubles accompanying or following Fevers, especially Typhoid Fever, by Jos. A. White, M.D.	136
Discussed by:—Dr. de Schweinitz.	137
Dr. White.	138
Posterior Sclerotomy as a preliminary to some operations for Glaucoma, by H. Gifford, M.D.	139
Commentaries on diseases of the Lachrymal Passages, by H. Gradie, M.D.	140
Discussed by:—Dr. Bettman.	140
Dr. Gould.	141
Persistent Spasm of Accommodation temporarily relieved by Tenotomy of the external recti, by Albert R. Baker, M.D.	142
Some practical experiences with Muscular Anomalies, by T. E. Murrell, M.D.	143
Discussed by:—Dr. Savage.	145
Dr. LeMond.	146
Dr. J. L. Thompson.	147
Dr. Risley.	148
Drs. Baker and Murrell.	149
Squint and its Treatment, by J. H. Thompson, M.D.	150
Discussed by:—Dr. Savage.	153
Dr. J. L. Thompson.	154

EDITORIAL.

Cataract.—Our European Guests.—The Pan-American Medical Congress.	155
Section of Ophthalmology, P—A. Medical Congress. —New Truths in Ophthalmology.	156

Department of Otology, Laryngology and Rhinology.

Macroscopical Researches on the Organ of Jacobson, by M. Range, Translated by E. C. Ellett, M.D.	157
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THE
OPHTHALMIC RECORD.

VOL. III.

OCTOBER, 1893.

No. 4.

THE SIMPLE DRESSING AFTER CATARACT
EXTRACTION.

Written for the Ophthalmic Record by

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Within a few years past so much has been written and said about the after treatment of cataract, that I have refrained from renewing the discussion; but my recent observations of the methods of other operators and conversations with them on the subject, together with a special request from the Editor of the *Ophthalmic Record*, have prompted me once again to lay before my confreres the reasons for the faith that is in me.

While, one by one, eye surgeons are venturing to dispense with bandages after extraction, the great majority have not done so, and are exceedingly timorous of making the trial.

Those who favor bandages claim that they afford the eye greater protection, are very little trouble to apply and are equally as comfortable to the patient as would be a strip of plaster over the lids. The supposition is, that packing around and over

the eye absorbent cotton or charpie and securing it by a somewhat resilient bandage preserves the normal shape or sphericity of the globe and prevents its movement.

A little reasoning ought, it seems, to convince any one of the fallacy of such reasoning. In the first place, the globe of the eye by reason of the tensile strength, inelasticity and resiliency of the outer covering, sclera and cornea, tends to preserve its proper curvature and shape unless divided to more than half its circumference. One can easily demonstrate the principle with a hollow rubber ball, by making a clean incision in it with a sharp knife. If the ball is not subjected to pressure the line of the incision is closed so effectually the place can hardly be found; but the slightest pressure on any portion of the ball will cause the incision to gape. So it is with the eye. Every one who has made many corneal sections has certainly been impressed with this fact. A nice clean section in the cornea, if no pressure on the globe by speculum or other instrument is permitted, will coapt so nicely that the place can scarcely be discovered; but the slightest touch on the globe will cause the wound to open.

The ideal condition for primary union in such a wound is to leave it in just the condition we see it when quiescent. How is this best accomplished? We know that the lids are perfectly adjusted to the front surface of the eyes, and are intended for their natural protectors.

When their free edges meet, the whole of the cornea and the sclera as far as the retrotarsal borders are ensheathed with a soft, smooth, evenly fitting cushion. Nothing more perfect can be devised. The lids being flexible, any pressure without will be conveyed through them to the corresponding part of the globe. The ideal dressing, then, will be that which will not in the least interfere with the normal shape and position of the closed lids. Is it possible by packing cotton around the eye and over its

front, held by a compress bandage, to add anything to the perfect coaptation of the lids to the front surface of the eye? On the contrary a perfectly uniform pressure is hardly possible. The dressing will be denser at one portion than another in spite of the greatest care; and the pressure will not be uniform, if there be pressure at all. In practice, two circumstances obviate what might otherwise prove a serious result of the use of bandages, viz., gaping of the corneal wound, and they are: first, the pressure is usually very light; and, second, the nice coaptation of the lids tends to hold the lips of the wound down and prevent their pouting or protrusion, and also to distribute the pressure if not too great, or uneven.

So that the chief credit must at last be given to the protection the lids afford.

We have further evidence of the perfect splint the normal lids are to the eye by the difficulty of getting a nice adjustment of the lips of a corneal wound, where the lids are much distorted as the result, for instance, of chronic granular conjunctivitis.

Again it is argued that a slight uniform pressure tends to prevent the muscular movements of the eye. There is doubt about the correctness of this. The only muscle so controlled is the orbicularis palpebrarum, and the slightest touch will usually quiet it when in a state of spasm, and nothing is more certain than fixing the lids by a strip of adhesive plaster extending from one to the other. As to the extrinsic ocular muscles, all disposition to spasmodic movements disappear naturally on closure of the lids. A quiet movement of the eyes under the lids will often take place however, when one is conscious, whether closed voluntarily or mechanically, and of which he will take no cognizance unless his attention is closely directed to it. I have had persons on whom I had performed extraction, complain of a soreness of the globe on movement under the bandage, a complaint I rarely hear since dispensing with bandages. I

attribute it to the uneven pressure of the bandage, likely the result—a most frequent circumstance—of slight displacement of the cotton batting by rubbing and boring the head in the pillow and dragging on the bandage. Restless persons often displace the dressing to some extent, however nicely put on.

There is no harm to a corneal wound by slight and even movements under perfectly adjusted lids; and sufficient pressure to control such movement would assuredly prove dangerous to a corneal section. In fact the eye is more apt to be quiet without pressure than with it, since any discomfort that might be caused by uneven pressure will most certainly give rise to involuntary and spasmodic movements. It is best, therefore, not to attempt to impede the movements of the eye by outward restraint, since observation has shown that no harm comes of it, if it occurs in a natural way; hence some operators now only dress the operated eye and let the other go free, not fearing the normal physiological movements it will impart to the fellow eye.

A prominent ophthalmologist and friend of mine, in Chicago, recently asked me what was to be gained by using adhesive strips over the lids, in the place of bandages. There are several advantages, and they are as follows:

First, the lids are used as the natural splint and protection to the wounded eye, and are merely secured in their most advantageous position without any risk of pressure on the globe.

Second, the eye has natural drainage, and there is no retention of secretions to become septic.

Third, the eye is always open to inspection and the slightest untoward event can generally be suspected by the appearance of the lids, and the character of the secretion, which readily flows out.

Fourth, atropia can be instilled into the eye daily, or several times daily when required, without removing the dressing, or in any way disturbing the eye.

These are all important matters and are decidedly in favor of the simple dressing. Whenever it is necessary to remove the dressing daily, for any purpose, as sometimes occurs, it is an easy matter to soak it off with the antiseptic wash, and put on a new strip when redressed. All readers of recent ophthalmic literature, doubtless are familiar with what I term, the *simple dressing*, viz., placing over the closed lids, extending from one to the other, a narrow strip of adhesive plaster, just sufficient to insure them perfect quiet in this position.

Dr. Charles E. Michel, to whom I owe my knowledge of this dressing, uses gold-beater's skin; others use isinglass plaster, which I also used for a long while; but for some time I have used Surgeon's white gelatole plaster, prepared by Johnson & Johnson. I prefer it because soft and pliant and very adhesive, while at the same time it is readily removed by thorough saturation with water.

I have used this dressing exclusively after all iridectomies and extractions for the last seven years. A bandage is rarely used in my ophthalmic practice, even following lid operations, which I prefer usually to leave open. My results have been all that could be expected, considering the nature of the case, complications, accidents during or after the operation, &c.; and I have thus far seen no cause for going back to bandages again. The most critical eye, with great loss of vitreous, normal or fluid, does not offer objection to the use of this dressing; on the contrary it seems better suited in these very cases, as I have often had occasion to verify.

In a subsequent paper, I will give my methods of dealing with my cataract patients during and after the operation.

MANAGEMENT OF THE PATIENT.

To those who believe in the greater security bandages offer the eye after a corneal section it may seem paradoxical, when I say that, with the discarding of bandages, I at the same time

began to allow my patients greater personal freedom after extraction. My first impressions in this direction were suggested by the difficulty I had, in demonstrating the operation for cataract, to the medical students in the medical department of the Arkansas Industrial University. Having no suitable hospital at that time, I was in the habit of taking the class to the residence or boarding house of the person to be operated, and had, by reason, to suffer many disadvantages and inconveniences. So when Dr. Michel informed me that he made his iridectomies office cases, I was prepared to venture on greater liberties.

I remembered also my first iridectomy on a half idiotic epileptic, who came along wandering from place to place, nearly blind from a central leucoma in each eye. I chloroformed him and made an upward iridectomy on each eye.

Following the orthodox methods, I had him carefully put to bed with bandaged eyes. But he could not be restrained, and the next morning I found him sitting up with eyes open and bandages off. I gave him a sound scolding, rebandaged his eyes, and put him to bed again. But it was to no purpose, for he soon had the bandages off and was wandering about the house, and on the fourth day he took his little bundle of clothing and departed. Some weeks later I met him wandering around with nice clear colobomata and very useful vision.

After making a number of iridectomies, both at the medical college and in my office, with no untoward results, I could not see why an extraction might not be made with like safety. I determined upon testing it. Soon an old colored man presented himself at the college, and I extracted a mature cataract from one eye, and sent him home in a rude wagon, a distance of a mile and a half. He recovered perfectly. Then another and another were operated on at the college, and allowed to go home in any manner they wished, the majority by walking. Being satisfied that the procedure was a safe one, I began to do nearly

all the extractions in my private practice in my office, on account of the saving of time and the better facilities for operating in a suitably arranged office.

Others were now allowing their patients greater freedom. Dr. Chisolm was operating down stairs, and allowing his patients to rise from the operating table, and walk up a flight of stairs to the eye ward. He further enlarged upon their liberties by dressing only the operated eye. Dr. Cheatham, about this time, published an article in which he announced that he was in the habit of operating for cataract, at the medical college, before the students, and allowing his patients to be led home. He was using bandages, while Dr. Chisolm was using the strip of plaster.

While I may not be entitled to priority in converting extraction into an office or dispensary operation, I claim to have ventured upon my own judgment, and to have done a number of such before any one else reported having done the same.

Having first established fully in my mind, the perfect safety of using the lids as a splint to the eye, I used no other dressing no matter what accident may have occurred during the operation. Extensive loss of vitreous, normal or fluid, was no counter indication to either the adhesive strip as the only dressing, or even to performing the operation in office or dispensary and sending the patient home.

The position of the body has but little to do with the condition of the eye, unless, of course the head is dependent. Observation will soon teach one that the gush of vitreous, that some times occurs during an extraction, whether it is fluid or not, is due to compression of the globe, by contraction of the recti muscles.

Without compression even fluid vitreous will not run out of an eye with a good sized corneal section, in whatever position the eye may be placed.

I one time attempted an extraction on a hypermature cataract

in a man eighty years old. The instant the capsulotome touched the lens, it disappeared in the vitreous chamber, and vitreous began to ooze out. I quieted the eye by removing the speculum and closing the lids a moment, and then proceeded to fish the lens out, in which I failed.

Fixing a head mirror on, I turned the patient on his stomach with his head projecting over the side of the operating chair, and face downward, and lay on my back upon the floor, with a beam of light thrown on the eye from the mirror. I was delighted to see the lens gravitate into the anterior chamber, and with a sharp hook, I easily captured it. No vitreous followed it, strange to say, notwithstanding the position of the head, and after a mild iritis, he made a good recovery with good vision, viz., about $\frac{20}{60}$. With a strip of isinglass plaster to hold the lids in position, he was allowed the use of the other eye, on which I had previously made a successful extraction, to see his way, and walked home alone, a distance of four squares.

In another instance the vitreous was fluid and half ran out, and the eye collapsed, and yet I only dressed the operated eye (the other was good) with a strip of plaster, and sent the patient home in a carriage, a mile or more from my office. This eye healed without a complication. Numerous other instances might be given to show that the fact of an eye being unsound is no special contraindication to the operation being performed in ones office, and the patient sent home, if not too great a distance, that is, within reach of the surgeon, that he may visit the patient daily. My patients are not required to lie down after they reach home; they may do as they like, lie down or sit up, only they are enjoined to keep quiet; and if they can see out of the other eye, not to use it more than is necessary, but not to attempt to read or even look about very much. These rules I have almost invariably found implicitly obeyed. Occasionally an unruly patient will violate every injunction, and then he

alone is responsible for the consequence. I have on two or three occasions after extraction, having left the other, in these instances a seeing, eye open, found the patient on my first visit to his residence on the following day, busily engaged in his or her usual avocations.

I did a simple extraction on a negro man last winter before the medical class, and he walked home a mile and a half, seeing his way with the other eye on which I had previously done the combined operation with good results. He never took to his bed, but living in a room to himself and having no one to wait on him, he made his own fires and fed himself. Result, a round central pupil, excellent vision, no mishap. I don't believe keeping the patient in bed is any guarantee against prolapse of the iris in simple extraction.

There are two cases on which I operated, that I would be glad to know the results. One, a negro man, took his little baggage, and boarded the train for home some twenty miles away, on the second morning after the extraction. I have never heard from him since. Another, a white man, a farmer, the next morning, eighteen hours after the extraction, mounted his horse and rode seventy-five miles to his home, being three days and nights on the way. He lost but little time after reaching home, but engaged at once in heavy work, such as chopping and rolling logs. From an account I got of him, I infer he did not have smooth healing and likely lost the eye.

Such extremes of course are folly; but there are certain restrictions that have been hitherto, and are still by many surgeons, put upon those who have submitted to an extraction, that are burdensome, and altogether unnecessary. I would briefly capitulate my views and methods, based upon seven years experience with them to the exclusion of all former methods:

1. The lids are the natural splint to the eye, and no other

dressing can avail anything beyond that necessary to maintain them in easy juxtaposition.

2. This is best done by a strip of isinglass, or gelatole plaster or gold-beater's skin extending from the outer surface of one lid to the other.

3. The dressing should not be disturbed without cause until healing is perfect.

4. It is unnecessary to close the unoperated eye.

5. It is safe to perform extraction in the surgeon's office, and send the patient home within visiting distance of the operator.

6. It is not necessary to confine the patient to bed.

7. It is unnecessary to darken the room beyond excluding any disagreeable light.

8. Fluid vitreous, dislocation of the lens and simple extraction are no contraindications to the foregoing rules.

**The Scientific Proceedings of the Section of Ophthalmology
of the American Medical Association, at the
Milwaukee Meeting, June, 1893.**

Continued from page 106, current volume.

ABSTRACT OF A PAPER ON
TWO CASES OF BRAIN TUMOR, WHERE OPTIC
NEURITIS WAS THE ONLY POSITIVE
SIGN.—AUTOPSIES.

BY E. P. MORROW, M.D., CANTON, OHIO.

Although pathognomonic symptom is a term in medicine, yet, taken in its strict interpretation, we have no symptom by which we can positively determine a disease without question. Taken in its better sense, a characteristic symptom of a disease, we may call optic neuritis a pathognomonic symptom of brain tumor. This has been so well established that it needs no discussion. The object of this report is not to further establish that fact, but to present two cases in which optic neuritis was the first, and up to the time of its discovery, the only positive sign upon which a diagnosis could be based. For that reason, I take it, brain tumor, with its ophthalmic aspects, may be worthy of a discussion here, in-as-much as the ophthalmologist is sometimes called upon to give his opinion and to aid in the diagnosis of a case.

To give positive or negative evidence as to choked disc may be all that is asked of him, but if he is also able by his knowledge of the relation between choked disc and intracranial diseases to differentiate between abscess, tumor, aneurismal tumor, etc., as well as to give some opinion as to its probable location within the skull, his services will surely be of more value than those of the specialist whose knowledge, as well as his practice, is limited to the eye.

Autopsy.—Body fairly well nourished. Calvarium well removed, external and internal surface of skull normal. Calvarium not unusually adherent to dura mater. Dura mater hyperemic. Surface of brain, when dura was removed, showed no abnormality or dissymmetry. No unusual amount of fluid in arachnoidal space. Brain removed without membranes. The optic nerves were exposed, showing to sight and touch no unusual appearance. Longitudinal sections of the brain were made from above downwards. The tissues were normal in appearance and consistency until the temporal lobe of right side was reached; here the tissues began to soften from above downward until a glioma, pear-shaped, amber in color, soft and somewhat commingled with the cerebral substance was found, lying at the base of the middle lobe. Its long axis, more than two inches, was directed backward and inward. The large end, over an inch in diameter, was backwards and within the temporo-sphenoidal lobe; the small end forward and outward.

Autopsy.—Body greatly emaciated. Calvarium removed. Membranes anemic. Membranes opened. No arachnoidal fluid. Brain removed without membranes. Surface of brain showed no dissymmetry, but bloodless. Sections of brain made horizontally from above downward; nothing abnormal except anemic condition until ventricles were opened. These were enormously enlarged and distended with fluid. Further sections of the cerebrum showed no evidence of lesion. When the cerebellum was examined a tumor, disc shaped, about one half inch in thickness and two inches in diameter, was observed upon the superior surface of the cerebellum, covering the superior vermiform process and extending about equally over each lateral hemisphere. The tumor was a soft glioma and broke down under slight pressure. An examination of the optic nerves showed nothing abnormal to sight or touch.

A point of interest in the autopsy is the absence of fluid in

the arachnoidal space in both cases, as well as the apparent normal state of the optic nerves to the unaided senses. No microscopic examination of the nerves was made to determine the condition of the sheath or intervaginal space.

Of the two prominent theories advanced for choked disc, viz., the lymph space, and the vaso-motor paralysis theory, I cannot see that these cases add to or subtract from either. Certain it is that our knowledge of the pathology of optic neuritis is unsatisfactory and that neither of the theories, clever and enticing as they are, are able to withstand criticism or investigation. The conclusions reached by Gowers are rational and in accord with the present state of our knowledge. He says it is probable that optic neuritis is rarely due to a single factor, and that the most potent element is the descent of a process of tissue irritation, which when it reaches the papilla sets up a more intense inflammation; that in some cases this influence is alone effective; that in others it is aided by the distension of the sheath which hinders the escape of effete products, increased edema, or even conveys irritating material.

The distinction between optic neuritis and choked disc is one of degree and not of mechanism. So far as optic neuritis has any single significance, it is that of irritative process within the skull.

DISCUSSION.

Dr. deSchweinitz :

I have listened with interest to Dr. Morrow's paper, and would urge the importance of placing upon record, in connection with careful ocular examination, all cases of intracranial lesion, especially tumors, in which the position of the disease had been substantiated by an autopsy.

We all know that there are the so-called "quiet regions" in the brain. I had a case, in my own practice, of large tumor of the right frontal lobe, without the presence of active symptoms

until about thirty hours before death. The tumor occupied the white matter of the right frontal lobe as far back as the bases of the first and second convolutions, and from the ventricular surface involved the head of the caudate nucleus, and, by softening, the structures as far back as the thalamus, and yet was practically, if not entirely, quiescent. Optic neuritis had been present for some time and was probably the only symptom of the brain tumor until thirty hours before death, when convulsions, hemiplegia and conjugate deviation of the head and eyes to the left side were noted. These symptoms were the result of a fresh hemorrhagic lesion in the left crus and on the left optic thalamus.

I would urge the importance of a careful examination of the field of vision in all cases, especially if operative interference upon the intracranial lesion is contemplated. I have the report of a case of epilepsy, not Jacksonian in type, which had existed for two years, with no other symptom save the convulsive attacks and headaches. The fields of vision were then concentrically contracted. Two years later double optic neuritis and left lateral hemianopsia were manifest. On the strength of the late development of the hemianopsia, Dr. Wood diagnosticated a secondary lesion in the cuneus, thinking it probable that the original lesion, a tumor, was connected with the cerebellum, because this was the "region of silence" nearest to the area which gave evidence of the disease by reason of the hemiopic defect in vision. The patient was trephined by the late Dr. Agnew, and a cystic tumor, or area of inflammatory degeneration, found within the cuneus beneath the grey matter. The patient died, and at the autopsy a large tumor, occupying the second and third temporal convolutions of the right side and approaching the fourth convolution, was discovered, together with a patch of hemorrhagic softening in the cuneus and a line of softening running nearly the whole length of the centre of

the occipital lobe. The field of vision in this case correctly located a lesion in the cuneus, although it gave no evidence of the tumor in the temporal lobe on the right side, which hence may be involved without the production of immediate direct symptoms. This case, utilized to illustrate the importance of the field of vision in localizing intracranial lesions, has been fully reported, both from the neurological and the surgical aspect, by Drs. Wood and White.

Dr. Morrow closing :

In reply to Dr. deSchweinitz remarks regarding the field of vision I will say that it was impossible to get any satisfactory tests of the field. Such rough tests that were possible were of no value and so were not reported.

I believe it to be highly important to impress upon the general practitioner the necessity of early and frequent examinations in cases of suspected head trouble as well as in those cases where the diagnosis is clear, for the reason that positive evidence can often be obtained by the ophthalmoscope and perimeter, both as to condition and location, that would escape other means.

ABSTRACT OF A PAPER ON
OPTIC NERVE TROUBLES ACCOMPANYING
OR FOLLOWING FEVERS, ESPECILLY
TYPHOID FEVER.

By JOS. A. WHITE, M.D.,
RICHMOND, VA.

Text-books say very little or nothing about optic nerve troubles accompanying or following fevers. It is therefore a field for research that will repay the labor expended. Many eyes are lost from atrophy after febrile affections. Before preparing this paper I wrote a few lines of inquiry to about thirty ophthalmic surgeons scattered over the whole country, east of the Rocky Mountains, asking their experience, and enclosing an addressed envelope for reply. Twenty-one responded. Six (Drs. Knapp, Burnett, Noyes, H. W. Williams, Gradle and Savage) said they had had little or no experience in optic nerve troubles in cases of fever. One (Dr. Calhoun) stated he could not recall to mind cases of this nature, but felt sure his record book would show he had met with them. Another (Dr. Hotz) said that his record book would also show cases of neuritis and atrophy following typhoid fever. Dr. Risley also stated he had seen such cases. Dr. J. L. Thompson had made similar observations. Dr. Jackson had seen cases but believed that there was an error in diagnosis, and that the real trouble was cerebro-spinal meningitis or typhoid fever complicated with meningitis. Dr. Kipp had seen cases. Dr. Michel expressed an opinion similar to that of Dr. Jackson. Dr. Bull had noticed cases of this kind. Dr. Oliver had also seen cases. Dr. L. Connor had seen atrophy that was ascribed to typhoid fever. Dr. Eugene Smith had also seen such cases. Dr. de Schweinitz reported that

he had seen optic nerve troubles in patients supposed to be suffering from typhoid fever., but in one case the autopsy revealed a tubercular meningitis. He had seen optic nerve troubles in malarial fever. Dr. Keyser had seen very few cases of optic nerve trouble after typhoid fever. Dr. Alt had not seen real and lasting atrophy following fever alone. Dr. Theobald had not seen pure optic neuritis following typhoid or malarial fever. Dr. Würdermann had seen such cases. Altogether the report shows optic nerve troubles accompanying or following fevers more common than is generally supposed. I have seen three cases: First, a case of optic neuritis after typhoid fever that recovered. Second, a case of atrophy after typhoid fever that has steadily improved under treatment. Third, a case of complete blindness after malarial fever which recovered perfect vision.

In treating my cases of atrophy, I depend largely on the sulphate of strychnia and dil. phosphoric acid. Beginning with a small dose, a gradual increase is made day after day until, in some cases, one-fifth of a grain is taken three times a day.

DISCUSSION.

Dr. de Schweinitz:

When I wrote to Dr. White concerning my experience with optic nerve atrophy in fevers, I was under the impression that he wished data only in so far as typhoid fever was concerned. I was not aware that the Doctor intended to cover a more extensive ground; otherwise I might have added other cases to those which I had reported.

I endorse thoroughly Dr. White's use of strychnia in optic nerve atrophy, especially its use in full physiological doses, believing that by these alone good results are produced, while practically no effect is achieved by the ordinary doses which are administered.

In discussing blindness after fevers it was very essential to eliminate the possible influence of quinine, which I have no doubt Dr. White has done in his case, and which, indeed, was practically excluded by the exceeding smallness of the dose. Nevertheless, small doses of quinine in patients exhibiting idiosyncrasies are quite capable of producing blindness. I have seen temporary amaurosis follow the administration of fifteen grains of quinine in divided doses during twenty-four hours; and Dr. Horatio Wood, of Philadelphia, has reported a like result after the exhibition of twelve grains.

Dr. White closing:

Dr. de Schweinitz seems to think that there was a possibility of this case being blind from the use of quinine, a thing which I carefully considered before attributing the blindness to optic nerve trouble caused by the fever. I have never seen as little as two grains of quinine at a dose produce blindness. Two or three grains daily until she had taken ten grains would hardly have been sufficient to produce an effect like this. I have seen cases where blindness was apparently produced by malarial influence before any quinine was given. These cases usually recover.

ABSTRACT OF A PAPER ON
POSTERIOR SCLEROTOMY AS A PRELIMINARY
TO SOME OPERATIONS FOR GLAUCOMA.

BY H. GIFFORD, M.D.,

OMAHA, NEB.

A simple iridectomy for glaucoma, where the tension is high, is often difficult and dangerous on account of the shallow anterior chamber, the tendency to loss of vitreous and the chance of the high pressure in the vitreous forcing the iris so firmly against the cornea that the anterior chamber may be very slow about refilling or may not refill at all; the eye remaining hard and the operation proving useless or worse. The chance of avoiding these complications is much greater if, immediately before making the iridectomy incision, a sub-conjunctival incision (3-4 mm. long) through the sclera into the anterior part of the vitreous be made with a cataract knife. This lowers the tension in the vitreous so that the anterior chamber becomes deeper, allowing the iridectomy incision to be made more easily; the danger of loss of vitreous through the iridectomy wound is practically done away with; tension in the vitreous is so much reduced that the anterior chamber refills promptly and the iris is pushed back from the outlets at the filtration angle. The preliminary sclerotomy is also useful in cases when, with high tension, the globe has to be opened for other purposes than to perform an iridectomy; for instance in extracting dislocated lenses it greatly lessens the danger of loss of vitreous. In one case of luxation of a transparent lens into the anterior chamber with secondary glaucoma the lens was restored to place and all bad symptoms relieved by a posterior sclerotomy. When the preliminary operation is made the iridectomy incision must be made with a sharp cataract knife, not with the spade knife.

ABSTRACT OF A PAPER ON
COMMENTARIES ON DISEASES OF THE
LACHRYMAL PASSAGES.

BY H. GRADLE, M.D.,
CHICAGO, ILL.

The writer divides patients with lachrymal disease into two classes, according to the degree of lachrymation. In the one class the eye waters only when exposed to wind or dust or eye-strain—in other words when the tear gland is called into activity by any occasional stimulus. In the second class the weeping is continuous. There must be in these patients some morbid irritation which maintains the continuous weeping. This source of irritation is sometimes an intra-nasal anomaly, more often the disease of the tear passage itself.

The prognosis as to rapidity and permanency of cure is invariably better when the lachrymation is of the occasional than when it is of the continuous type. The difference in results in different patients is less due to the therapeutic method than to the nature of the disease.

The author recommends electrolysis of the duct in cases of stricture in which the probe can enter without undue force.

DISCUSSION.

Dr. Bettman:

It seems to me that the division referred to by Dr. Gradle is a very wise one indeed. There is a great number of cases of epiphora where there is no stricture, but a hypersecretion of tears due simply to reflex action from membranes of the nose. In these cases I have been contented to wash out the lachrymal passages, and if I find water passes through nicely into the nose I am sure the duct is open.

To the remark made by Dr. Wood in reference to the introduction of probes by Becker I would say that Dr. Becker would not have been satisfied to use the probes 1 & 2 only, but he used 4, 5, 6 and 7. He passed them in rapid succession one after another, after having dilated the lachrymal duct with a No. 5 Bowman tapering to a fine point.

Dr. Gould :

I am sorry I arrived too late to hear Dr. Gradle's paper in full, but I wish to say a word in regard to the plan of treatment which I have found successful in these obstructions of the lachrymal duct. The patient being in a recumbent position, I flood the eye with a simple astringent and antiseptic solution. Then emptying the sac by pressure I again allow the solution to pass into the sac and duct, again pressing it out ; and so on for several minutes, twice or three times a day. I have been carrying on this plan of treatment during the last year and have only found two cases where it was not successful. It has certainly been most satisfactory so far as my own practice is concerned ; and I have received word from two or three others who have found it equally successful. I find it often impossible to tell at a glance just what sort of stricture we have ; and this at least is a ready means of differential diagnosis.

I believe it will effect a cure in all cases where the stenosis is functional, due to congestion, etc., but not of course when there is organic stricture.

I had a patient come to me after she had been treated unsuccessfully for a great number of years. It is true it took me two or three months to effect a cure, but being under this treatment for that length of time she is now a well woman.

ABSTRACT OF A PAPER ON
PERSISTENT SPASM OF ACCOMMODATION TEMPORARILY RELIEVED BY TENOTOMY OF THE
EXTERNAL RECTI.

ALBERT R. BAKER, M.D.,
CLEVELAND, OHIO.

I believe that nearly all the troubles we have with the muscles of the eye-ball are due to, and are the direct outgrowth of, the errors of refraction. This is generally recognized in cases of hypermetropia as a cause of strabismus.

In most cases of muscular asthenopia we have the same excessive nervous stimuli sent to one pair of muscles that we do in strabismus; and those patients who have not sacrificed binocular vision consequently suffer from pain and other nervous disturbances due to the conflicting efforts at accommodation, on the one hand, and those of convergence on the other. It has been my experience not infrequently in cases of errors of refraction, after correcting the ametropia, to find that, while I had relieved the pain due to the efforts at accommodation, I had disturbed the equilibrium that had become established between the efforts of accommodation and those necessary for binocular vision, and thus set up a train of symptoms almost if not quite as annoying as those from which the patient suffered before. And on the other hand after performing tenotomy of one or more of the recti muscles I have relieved these patients of one kind of distressing symptoms only to be followed by others fully as bad. So that I am skeptical as to the possibility of benefitting any case of asthenopia by a tenotomy in which prisms or the closing of one eye does not give at least partial relief. It has been my practice in these cases to first correct

the error of refraction; if the asthenopia is not cured, then to resort to the use of prisms and the systematic exercise of the muscles. If the prisms or suppressing the image in one eye gives partial relief, I then propose a tenotomy with considerable assurance that it will afford permanent relief, doing permanently what the prisms do temporarily. But in all cases in which no perceptible improvement can be obtained by the use of prisms or muscular exercise, I give a very guarded prognosis as to the result of a tenotomy, because in my experience these cases have usually proved unsatisfactory, the disease as I believe, being the local expression of a general neurosis and often not amenable to ocular treatment.

ABSTRACT OF A PAPER ON
SOME PRACTICAL EXPERIENCES WITH
MUSCULAR AMOMALIES,

BY T. E. MURRELL, M.D.,
ST. LOUIS, MO.

The Maddox rod is the most reliable test for heterophoria we have. Prince's phorometer is a convenient and ingenious application of the rod test. The Grafe test is not reliable in small errors, especially for hyperphorias which are important to a half degree or less. No eye suffering from asthenopia is completely examined until the muscular balance is carefully tested. Heterophoria is closely related to errors of refraction and also to amblyopia of low degree.

A case is cited where an esophoria of 10° is relieved by correcting an astigmatism of 0.25 D. Lateral tendencies of 1° to 4° quite common and, unless asthenopia exists, should be considered physiological. An orthophoria or even an esophoria

may be converted into exophoria by withdrawing the tension on the accommodation. A case is cited. The neurotic suffer most from heterophorias and are the most difficult to relieve. Variable eso- and exo-phorias are not always due to hyperphoria as claimed by Dr. Stevens. A case is cited of marked exophoria, being sometimes orthophoria, and even esophoria, with no hyperphoria. The vertical deviations are the most distressing and should be first corrected. A case cited with persistent diplopia in long standing high grade of esotropia, after correcting which there was no further confusion, although there was a hyperphoria of 6° , a prism to correct which added to comfort. Does not follow Prince's rule to correct half the hyperphoria, and one half to one fourth the eso- or exo-phoria, but corrects the whole hyperphoria, the greater portion of the exophoria and one half or less, of the esophoria. Treatment by prisms or by decentering the lenses satisfactory only in small errors, and not always in them; in the greater errors they are unsatisfactory. Orthoptic training, sometimes good, is tedious and often disappointing. The method likely at fault. Alternate contraction and relaxation, as suggested by Savage, more in accord with physiology.

Cases that will not yield to orthoptic training should be submitted to surgery. A practical rule by Savage: "Whenever the red glass over one eye shows diplopia, or there is a hyperphoria of 3° , or an esophoria of 10° we should operate." Careful partial, or even total, tenotomies, gauging the extent by the result obtained, frequently testing as the operator proceeds, is the method preferred. Advancing may be called for. Some cases of heterophoria are very stubborn to correction, whether from "antipathy to single vision" or from heterophoria, according to Stevens, a question not altogether settled. A case cited calling for repeated operations, giving each time temporary relief, and in the end pretty nearly, but not quite, correcting

all heterophoria, but still unsatisfactory as to the relief of a train of nervous phenomena unquestionably attributable to the heterophoria.

DISCUSSION.

Dr. Savage :

I always like to give a reason for the faith that is within me, but not being able to do so in so short a time as five minutes, I must refer you to the last issue of my journal, to the two papers, one on "Rhythmic Exercise, the Proper Method of Developing the Ocular Muscles," and the other on "the Relationship between the Centers of Accommodation and Convergence." In one or the other of these papers you will find a reason for every statement I shall make. In the first place we have two forms of esophoria: true esophoria, dependent on the natural structure of the muscle or its attachment, and pseudo-esophoria, dependent on the relationship between the centers of accommodation and convergence. Likewise we have two forms of exophoria, a true and a psuedo. In reference to Dr. Baker's case I will say that spasm of accommodation, in the true sense, is always associated with, and dependent on, exophoria, and therefore can be cured by correcting the exophoric condition. If the patient is myopic a part of his exophoria—in some cases the whole of it—may be relieved by prescribing a full correction of the myopia; but if the patient is hypermetropic a full correction, or even a partial correction, of the focal error will make the patient worse by adding a pseudo-exophoria to his true exophoria. When the exophoria is as great as in Dr. Baker's case, a part of this condition must be relieved by operation. In operating on a case of this kind only the exophoria for distance should be corrected, leaving the remaining exophoria in the near to be corrected by rhythmic exercise. It is always well to divide the operative effect between the two corresponding muscles. It is my practice to operate on one

muscle *one* time only; but I never divide a tendon completely in any form of heterophoria, always leaving a few fibres above and below to prevent the muscle's retracting too far.

Exophoria in emmetropic and in hypermetropic eyes grows worse with advancing years, while an esophoria in such eyes decreases as the patient grows older.

Dr. LeMond:

I have had some experience in the anomalies of refraction, in connection with asthenopia and a want of muscular equilibrium, and in trying to establish the same by tenotomies of the ocular muscles. And I have come to the same conclusion as the old negro who undertook to eat the largest potato in the country, who said: "The more I ate the larger the potato got." So it is with me in regard to muscular anomalies, combined with the errors of refraction: the more we cut then and the more attention we pay to the muscles alone, the greater the subject gets on our hands.

I think the digestive system often plays a very important part in these affections. In other parts of the body we might ascertain what cause existed that was assisting, in a reflex way, in augmenting the ocular anomalies. I think the more attention we pay to the whole body, but at the same time not neglecting the eye in our investigation, the more successful we will be. I think a great many of these troubles are augmented, very largely, in people suffering from nervous depression and poor digestion in connection with bad hygienic surroundings and the want of proper kind and amount of food.

In females, my experience teaches me that these troubles are often associated with uterine troubles of various kinds, which are always ready to act in conjunction with these complicated ocular troubles in pulling down the system; and so a *vade mecum* is formed. I have quit looking for emmetropic eyes, for I believe

on a close and careful examination that we would not find one eye in one hundred to be in a state of absolute muscular equilibrium.

If decided squint is absent by no means tenotomize the muscles. Exercise them with prisms, in a gymnastic sense, say ten to twenty minutes once a day, but do not proscribe prisms for constant use. Correct the manifest hyperopia or myopia and the astigmatism which, I think, you will find in nineteen cases out of twenty. If the patient is under thirty years of age I give them seventy-five per cent of a full correction, with glasses, and I think I can safely say that nineteen cases out of twenty, which have come into my hands, have been relieved.

Dr. J. L. Thompson :

My experience is somewhat like that last given. We are indebted to Dr. Murrell for the interesting paper and classification. I believe there is a very large class of these patients who can be cured, or relieved almost entirely, by the correction of refraction. This will include 90% or more of the muscular conditions. A number of years ago when I first began practicing I corrected, as far as possible, the muscle errors by use of prisms and would get almost entire relief; and almost invariably on correcting the refractive error, the astigmatism particularly, would get entire relief. In correcting astigmatism alone I believe relief often comes to the patient. There will be a small percent of these patients who will have to have the muscular anomalies corrected by operation, but the majority yield to correction of refractive errors. It is a bad thing to be picking at one muscle so many times. I have had patients who wore the prisms for some months and not a particle of insufficiency of the recti muscles existed after two years. I do not believe that a partial tenotomy ever benefited a case on this earth, but that all such reported cases would have done just as well without the operation.

[The last wail of my friend Thompson indicates that he is passing through the throes of that agony that must precede the giving up of old and cherished views, in order to the acceptance of new but valuable doctrine.—Editor.]

Dr. Risley :

I wish to express my gratification over the conservative tone which has characterized the discussion of these papers. In the management of the anomalies of muscular balance it is possible that, in some instances, too great enthusiasm and inadequate study of the case in hand have led some operators beyond the bounds of prudence. Indeed I have already seen the consequences of mistakes in this direction. I have under observation a gentleman suffering from incipient tabes, with impaired reflexes, lightning pains etc., who had, nevertheless, had his external rectus cut for a supposed exophoria. I have another patient with impaired innervation of the interni from obscure nuclear disease, which had been overlooked and the externi cut by an enthusiastic surgeon, this too when a careful study of the strength of the muscles had shown but six degrees of abduction and to degrees of adduction. Fortunately no great harm could result under such conditions; but such instances demonstrate the necessity for great caution, lest the early symptoms of a nuclear palsy, or the incipient stage of tabes, which so frequently declares itself in transient ocular symptoms, should be mistaken for so-called heterophoria. When attention was first called to this subject in its most modern phase, I could but wonder how I had succeeded in relieving so many people of their asthenopia, being unmindful of the reputed frequency of these anomalies of the vertical muscles, and in a measure also of the external rectus. A more careful study of these persons who had not experienced entire relief from correcting glasses and careful attention to general health etc., soon convinced me that in a certain number of cases the trouble was due to some form of

muscular anomaly. Within a few years I have succeeded, either by carefully adjusted prisms or by tenotomy, in greatly relieving a large number of my former patients and others. Therefore while mistakes may have occurred and inordinate claims for the efficacy of tenotomy in curing diseases of the general nervous system may have been made, still I am sure there is too much of truth in these claims, and too much of real value in the careful study and treatment of heterophoria to relegate the whole subject to the realm of the charlatan.

Dr. Baker closing :

I do not wish to convey the idea that there is nothing to be gained in these operations for heterophoria; in fact I make them and possibly as often as any one here (but not as often as some of my neighbors whom a friend of mine calls "post-graduate fiends") and get good results in most cases. The point I wish to make is this: Which are the operative cases? Not such a case as this: A patient came to my office some time ago in which a so-called oculist had proposed an operation for heterophoria and yet the patient had one and one-half D. of hypermetropia which had not been corrected. I gave him a pair of spectacles; his muscular insufficiency disappeared together with all asthenopic symptoms.

The muscular insufficiency in this case was caused by the error of refraction, as I believe it to be in ninety-nine cases out of a hundred. In nineteen cases out of twenty, if we correct the refractive error we will give comfort to our patients. In all I prescribe lenses that fully correct the error of refraction and tell the patient to wear them a certain length of time and if the symptoms of asthenopia do not disappear I then correct with prisms, muscular exercise or by an operation.

Dr. Murrell closing :

I believe that this subject of muscle errors is very imperfect-

ly understood by the majority of men in our profession. I confess I knew nothing of muscle errors until within the last year. I am just beginning to see light; that there is something in it there is no doubt. I take a very conservative view of this subject of operation. I have had patients bring their glasses back and object to taking them because they did not give entire satisfaction. Until I began to search for these muscle errors I could not find what the cause of complaint was. I have prescribed prisms in a number of cases lately giving complete relief in a large portion. When a patient comes to me I first correct the refractive error, and then correct the muscle error by prisms, and if this fails to give relief I perform a tenotomy.

Dr. Savage has devised means by which we can exercise the ocular muscles, and thereby develop them. The character of exercise set forth by him in a recent publication in rhythmic and must, in all cases, stop short of fatigue.

ABSTRACT OF A PAPER ON
SQUINT AND ITS TREATMENT,

BY J. H. THOMPSON, M.D.,
KANSAS CITY, MO.

All will agree with me that the common operation for converging squint is by no means perfected. Of all operations on the eye, next to iridectomy for acute inflammatory glaucoma, I believe the operation for squint to be the most difficult. Yet every traveling quack and all the post-graduate enthusiasts will tenotomize a rectus muscle at any time, on any kind of a patient. In conversation with some members of the profession a few years ago, some of them stated that the correction of strabismus was "Child's-play," and almost beneath the dignity of and eye

clinic. It is an easy enough matter to straighten the eye of a child with immediate bright result; but with a large majority of these cases the more satisfactory the operation primarily the more disastrous the remote consequences. I am inclined to believe that many people never acquire binocular vision, the visual apparatus being defective either in a want of commissural fibers between the two visual centers, or an abnormal relationship between these centers and the psychological areas in the cerebral cortex. Not many days ago I examined a man thirty years old who had alternating converging strabismus. The vision in each eye tested separately was $\frac{2}{18}$. If looking to the left of the vertical plane, he would use the left eye and squint the right; if to the right of that plane, he would use the right eye and squint the left. No combination of prisms or colored glasses could excite diplopia. His refraction was hypermetropia $2\frac{1}{2}$ D. In this case the patient suppressed the visual field in the eye not in use at the time. I have seen the same thing in young children in beginning squint.

It cannot be denied that some children are born with an ambliopic condition. It is also certain that the majority of children with beginning squint, if observed closely, will show an ambliopic condition which could not be the result of the disuse of the eye, because of its existing so early. So often have I observed this that I consider it to be a rule rather than an exception; and I believe that congenital amblyopia is the predisposing cause of the squint in these cases. Hyperopia is evidently the exciting cause; but we all know that many young hypermetropes can overcome a high degree of refractive error without fatigue of the ciliary muscle, and are seldom called upon to assist the accommodation by convergence. Hypermetropia combined with monocular amblyopia is hardly sufficient in itself to cause strabismus, because if we render the eye emmetropic with glasses, even at the time of periodic squint, there is no

certainly that the deformity will disappear. Although some writers insist on such conservative treatment, the results are not satisfactory. It seems to me that often the external recti muscles are not capable of holding the optic axes parallel, since we know that the center of rotation lies outside of the vertical muscular plane, or of the plane of the superior and inferior recti muscles. So complicated in its nature is an internal squint that the operation for its correction is not so simple a procedure as many seem to believe. A most careful study should be made of every case.

It cannot be denied that the continued wearing of glasses may cure some cases; but, if I am not mistaken, the method is much less satisfactory than the surgical means at our command. It has this advantage: it can be tried at a time of life when all operative procedures are to be condemned. I am not in favor of prescribing glasses, however, for young children; and I always feel, when I see a baby in spectacles, that theory has run away with common sense. In squint dependent on simple hyperopia, when the vision of both eyes is good, binocular vision may be secured by a simple tenotomy and the wearing of correcting lenses, provided the patient is less than thirteen and more than eight. For reasons well understood, in making a simple tenotomy the operation should be divided between the two eyes and the cutting of the capsule should be in proportion to the degree of convergence. Stevens method of modified tenotomy has immensely simplified this operation and makes it possible to accurately gauge the effect.

Some of us are in favor of rotating the eye outward by means of a stitch, but some are afraid that this stitch has done more harm than good. Between the age of eight and thirteen years the stitch is certainly not necessary. In doing any operation for the cure of squint it is better to undercorrect than to overcorrect.

DISCUSSION.

Dr. Savage :

In order to save time I will make a few statements, and for the reasons on which these statements are founded, I must again refer you to the last issue of my journal. One of two things must always be at the bottom of internal squint, viz., Intrinsic esophoria and pseudo-esophoria. In most cases the two coexist. Other conditions, such as a corneal scar or an amblyopia, are often associated with these causes. Hypermetropia, the cause of pseudo-esophoria, nearly always is found in cases of internal squint. True esophoria is rarely so great that the guiding sensation cannot restrain it, but when a pseudo-esophoria is grafted onto it, the two combined throw off the mastery of the guiding sensation and there results a *turning* where before there was only a *tendency*. The two forms of esophoria may be restrained by the guiding sensation for a long while (in most cases for a lifetime) when something disturbs the nerve centres and the esotropia occurs, the guiding sensation having lost its control. In all cases of internal squint the first thing to be thought of is the destruction of the pseudo-esophoria. This is readily effected by a mydriatic, the first effect of which, however, is to increase the squint by increasing the pseudo-esophoria. The pseudo-esophoria having been cured in this way, the true esophoria may be again brought under the control of the guiding sensation, the eye swinging itself suddenly or by degrees into line. In very young children the mydriatic often is enough to effect the straightening of the eyes. In older children the hypermetropia should always be corrected to the fullest. The correcting lenses, unaided by the continued use of mydriatic, in some cases will cure the squint by removing the pseudo-esophoria; but in many cases the mydriatic must be made to aid the lenses because of a disposition, continued for a longer or shorter time, on the part of the eyes to cross when an attempt

is made to fix on the near point. When squint is thus cured there always remains the true esophoria which, at some time, may have to be treated either by rhythmic exercise or by partial tenotomies.

But the great majority of these cases of internal squint are brought for treatment at a time when mydriatics and lenses cannot effect a cure. The balance must be done by tenotomies, complete when necessary, partial when possible. In all these cases the fully correcting convex lenses should first be determined, and an estimate made as to how much of the condition they will relieve. Then as little cutting of tendon and capsule should be done as possible.

Dr. J. L. Thompson :

I had a patient, quite a little child only three months old, who had strabismus in one eye only. By using the atropine I straightened her eyes. I have had patients where the eye turned in a good deal, in which I have used the mydriatic and glasses as early as the eighteenth month, who were very much benefited. In other patients I have operated on the muscle and have had success. In a certain number of cases we will never be successful by all the operative measures that have ever been devised. The only thing to do in these cases is to watch them. You will operate on a patient getting beautiful results and ten years later you will have something that does not suit you at all—the eye turns the other way. These patients we feel like sliding on some one more sanguine as to results. We had better never had anything to do with them. Concerning the question of ambliopia I will say that I am satisfied that in numerous cases there is more than heterophoria that causes strabismus.

[*The discussion of Strabismus will be continued in the next number.*
—Editor.]

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See the pink slip in your copy of this issue of the *Record*.

CATARACT.

After reading Dr. Murrell's valuable paper on "the simple dressing after cataract extraction," published in this issue, turn to Landolt's paper on "cataract operation in our time," published in double no. (4 and 5), vol. 2 of this *Journal*, and read it, if you have not already done so. Both of these papers will bear a second reading.

OUR EUROPEAN GUESTS.

Dr. Wolf, of Glasgow, and Dr. H. Snellen, Jr., of Utrecht, were present at every session of the Ophthalmic Section, P—A. M. Congress, and participated in the discussion. Dr. Wolfe is noted for his transplantations of skin without a pedicle. Dr. Snellen is the son of the man who gave to us our test letters. It was a pleasure to have those gentlemen with us.

THE PAN-AMERICAN MEDICAL CONGRESS.

Was a success, viewing it from any and every standpoint. The attendance was large—about twelve hundred—and the scientific work done was of a high order of merit, as the volume to be published will show. The attendance from

Mexico was larger than from any other country south of us; but the medical fraternity of nearly all the governments of the Americas was represented. A noticable feature of this meeting was the absence of many faces so familiar at the meetings of the American Medical Association.

The next meeting will be held in the city of Mexico three or four years hence.

SECTION OF OPHTHALMOLOGY, PAN-AMERICAN MED. CONGRESS.

As was to be expected, Pres. Chisolm and Secretary Gould had worked up a good interest, before the meeting. The attendance was large and the work done was good from beginning to end. All papers were listened to attentively; and the discussions were courteous though sometimes animated. Altogether much good—practical good—will result from this meeting.

As before announced, the second and third days were devoted to the study of "refractive errors" and "muscular errors" respectively. These papers, and the discussions elicited, are now being prepared for publication in this *Journal*, for the benefit of those readers of the *Record* who were not fortunate enough to be members of the Congress. These publications will go far towards enriching the current volume of the *Record*.

NEW TRUTHS IN OPHTHALMOLOGY.

This little book, as announced on third page of cover, is now in the hands of the printer and will be ready for distribution by Nov. 1st, next. The author as a matter of preference is also the publisher. The price (one dollar) which he has placed on the book is so low that he cannot afford the usual trade discount, and for this reason it will not be handled through book houses; nor will it be put in the hands of agents. One dollar sent direct to the author will secure the prompt sending of the little book—It is not the aim of the Editor of this *Journal*, who is also author of the volume, to praise this book to our subscribers or to prejudice them against it. Some of the facts pertaining to it are set forth on the advertising page already referred to. The author greatly appreciates the fact that many of the readers of the *Record* have already sent in their orders for the book. The author hopes it will be helpful to all who read it.

Department of Otology, Laryngology and Rhinology.

GEO. H. PRICE, M. D., EDITOR, 621½ Church Street,
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MACROSCOPICAL RESEARCHES ON THE ORGAN OF JACOBSON.

By M. RANGE,

Member of French Society of Otology and Laryngology.

Translated from the *Revue de Laryngologie d' Otologie, et de Rhinologie*

By EDWARD C. ELLETT, M.D.,

Assistant Instructor in Microscopy, etc., in the Memphis
Hospital Medical College.

The fibro-cartilaginous diverticulum discovered by Jacobson on each side of the nasal septum excites but little interest at present, except among naturalists, and most human anatomists simply mention it. Very unequally developed in the animal series, and reduced, in the higher species, to a mere rudiment, like the pineal gland and vermiform appendix, it is no more in the human nose than a scarcely discernible ancestral souvenir, whose very position is difficult to locate. Reduced, in the septum of man, to an almost imperceptible cul-de-sac, which many rhinologists have never seen, this organ, without apparent functions, has for us no other anatomical interest than the problem of comparative morphology which it presents. If, nevertheless, I speak to you of this rudimentary organ, it is because it is being much spoken of, and it has recently raised a number of questions which do not have to do solely with scientific anatomy but are of interest directly to the clinicians.

At the International Congress at Berlin, Messrs Loewe, Onodi, and Sandmann showed its probable rôle in the formation of certain abnormal thickenings of the septum and M. Potiquet (Soc. de Laryng. de Paris, Nov. 6th., 1881.) intimates, without

however affirming it, that the depression which represents this rudimentary vestige in man, might very well be the point of departure of those perforating ulcers of the septum described in late years by Voltolini, (1888) Rossbach (1889) and Hapek (1891). On the whole, like many organs in the part of regressive disappearance, this apparatus seems to manifest its presence only by pathological processes; it recalls from this point of view, the cecal appendix, which serves little for any other purpose than to cause appendicitis; or the intermaxillary bone, which remains temporarily distinct in the human embryo without other apparent utility than to establish itself in a subsequent hare-lip, and all developmental deformities of which this region has the unfortunate privilege. This circumstance really gives, I think, to the organ of Jacobson, a fresh practical interest, which serves to draw the attention of clinicians to it. This is why I thought it worth while to show to you, by actual specimens, what this organ is in the animal species, where it attains its complete development, and to try to locate in man the undeveloped element which represents it. The organ of Jacobson, described for the first time in 1811 by the author who has given to it his name, shows itself in its most complete form in the ruminants and rodents, but it is undoubtedly in the cow and sheep that it can be most easily seen. It presents itself in the form of a cartilaginous tube enclosing a cylindrical fibrous sac, and extending on each side of the nasal septum, to the surface of which it is closely applied. Immediately beneath the inferior border of the quadrilateral cartilage, from which they seem suspended, these two canals run parallel, in the antero-posterior direction, a little above the angle of junction of the septum and the floor of the nares, separated in the median line by the osseous vomer. The posterior extremity terminates in a cul-de-sac, whose wall shows no other opening than the small foramina by which the vessels and nerves enter the cavity of the tube. The anterior extremity of the canal, on the contrary, shows a gaping orifice, which opens principally below, but at a different situation in different animals. In the rodents it opens directly into the nasal fossa, while in ruminants it opens into the anterior palatine canal. To demonstrate these

details I have made three series of preparations. I here show you, either the specimens themselves, where it has been possible to preserve them, or photographs of them. The first series consists of transverse sections, showing the canal at different antero-posterior levels; the second are whole preparations, showing the organ dissected after exposing it by a slightly lateral sagittal section; finally the other preparations, not of least importance, show the manner in which the canal of Jacobson opens in front into the anterior palatine canal. In the frontal sections, which are, as you see, the most elegant and the most easily understood, the two canals of Jacobson are cut perpendicularly to their axes. These sections show two cartilaginous rings, bearing superiorly, an ascending process, which makes them resemble two racquets, of which the process is the handle. It is by these vertical handles that the canals seem to be suspended from the septal cartilage, which insinuates its thick inferior border between the two. The cartilaginous ring which surrounds the lumen of the canal and forms the frame of the racquet, is perfectly round at the level of the most anterior section. In proportion as the plane of section goes back, the canal flattens transversely, and takes an elliptical form with its long axis vertical. Such is the condition which I have found constant in the sheep, in preparing a large number of successive sections of the nasal fossæ from the incisor canal to the posterior cul-de-sac of the organ of Jacobson.

The arrangement differs slightly in the cow. Instead of descending vertically, as we have seen it do in the sheep, the part which I have just compared to the handle of a racquet, takes a very oblique direction, indeed almost horizontal, at the level of the anterior sections. The two cartilaginous circles are thus displaced outwards and more widely separated than in the sheep. Moreover the cartilaginous frame is incomplete, wanting below and out, and is here replaced by a fibrous wall, just as the fibrous portion of the eustachian tube completes the cartilaginous portion. In the cow, as in the sheep, the center of this cartilaginous ring, which represents the lumen of the tube, is filled by a soft reddish substance into which a probe penetrates easily, and which exudes, on pressure, a viscid material, and some blood.

The second series of preparations shows the whole canal as it is seen on antero-posterior section, when the mucous membrane of the septum is removed. Here the organ of Jacobson is seen as a blind tube, attached to the bony septum, which is grooved for its reception. A probe, introduced by the anterior opening through the incisor canal, penetrates to the cul-de-sac which terminates the organ posteriorly. It is seen that the direction of the canal is slightly ascending from before backward, that its lumen easily admits a No. 5 Bowman probe, and that its length does not exceed four or five centimeters. To show the opening of the canal of Jacobson in the anterior palatine canal, I have resorted to a somewhat more complicated preparation; on a grooved sound introduced into the incisor canal by its inferior osifice, I have cut the lower wall of this canal, the upper wall being thus exposed, one sees on the anterior third of this wall a very small antero-posterior slit-like opening, attaining, in the cow, a length of six to eight millimeters; a probe introduced into this opening and pushed upward and backward penetrates directly into the canal of Jacobson. This relation of the two canals is not very easy to see well. It is however, sufficiently clear in the present specimen, which shows the anterior segment of the palatine arch of the cow, with the anterior palatine canal opened along the inferior wall.

Such is the demonstration of the gross anatomy to which I limit this study, reserving, to treat elsewhere, other questions, not less interesting, but which I cannot approach to-day without detaining you too long. It suffices for me to show, that although less well supplied in this respect than the sheep and cow, we possess, like them, an organ of Jacobson; that the most probable representative of that organ in the human nasal fossa, is a cul-de-sac buried in the mucous membrane of the septum about eight and a half millimeters from the floor of the nares, and twenty three millimeters from the point of junction of the lip with the membranous septum (Koelliker); that the orifice of this canal does not exceed one millimeter, it is almost always possible to find it on the cadaver, and that M. Potiquet was successful in the catheterization of it on the living subject. As for the cartilaginous envelope which we have just seen formed a continuous tubular sheath around the fibrous sac, it has undergone, in mass, a complete transformation, not only in its appearance, but even in its situation. It seems to be represented by the longitudinal plates described by M. Sappy under the name of "Posterior Accessory Cartilages," and situated on each side of the septum, above the antero-inferior nasal spine, at the level of the inferior angle of the quadrilateral cartilage.

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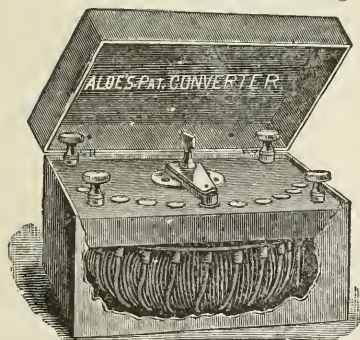
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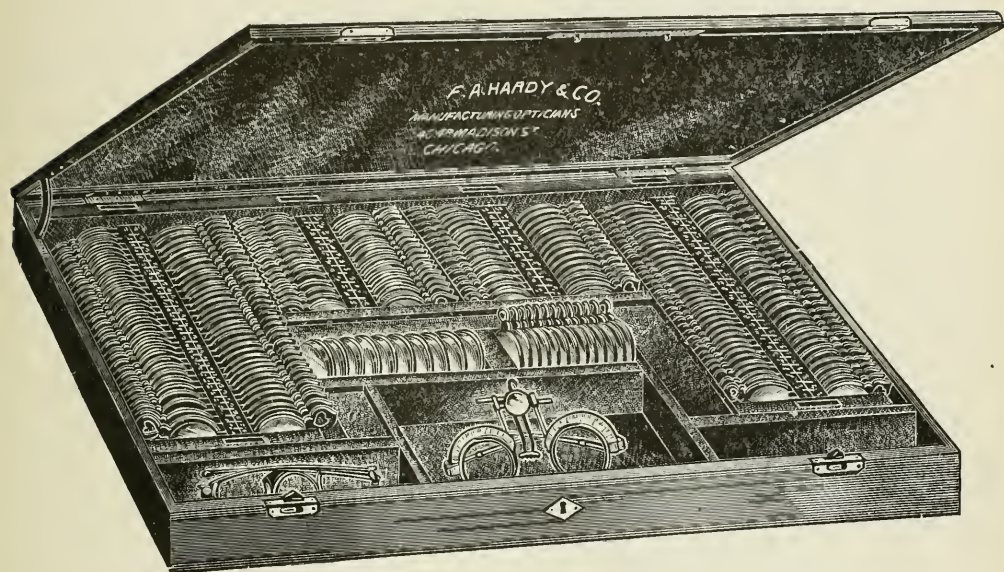
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